Lord Rosse (*Observations of Nebulæ and Clusters of Stars*, p. 121) records six observations of the nebula between 1850 and 1867, and describes it as another spiral with two arms and some stars in the *following* arm; the centre is bright; 12 minutes *preceding* and a little *south* is another nebula (*h* 1442) elongated; and 30 minutes *north following* is a third, elongated *north* and *south*.

The nebula (H I. 84) is by Lord Rosse described as very large and very bright. The centre itself is like an elongated nebula with nucleus. This centre is enveloped in an irregular ring or rings of nebulous light, and he gives a rough marginal sketch of it.

The nebula *h* 1442 is described as very patchy and a faint nucleus suspected, with one faint star south of it.

The photograph shows the nebula H I. 84 to be a symmetrical ellipse and not a spiral, with the major axis in *north following* to *south preceding* direction, and the nucleus is a nebulous star of about 12th magnitude. Both the star and the nebulosity surrounding it have well-defined margins, the nebulosity having a ringlike boundary. Surrounding the nucleus, at a great distance, is a well-defined ring, but deformed on the *north following* side, and in the ring are involved several starlike condensations of nebulosity. Outside this ring is another faint ring symmetrical with it, but discontinuous on the *north following* side, and there is in it some evidence of nebulous condensations; there is also some indication of the existence of another very faint ring outside this. In the divisions between the rings are five well-defined stars of 15th to 16th magnitude, that may or may not be physically connected with the nebula. Several of the features which I have referred to must have been observed by Lord Rosse.

The nebula *h* 1442 is 54 seconds of time *preceding* H I. 84, and has a stellar nucleus surrounded by nebulosity which is elongated nearly in *north* and *south* direction, and has two faint condensations involved. It is a small, faint, elliptical nebula.

The nebula H II. 344 is $1^m\ 18^s$ *following*, and 17 minutes of arc *north* of 84, and has a small bright stellar nucleus and dense nebulosity elongated in *north following* to *south preceding* direction. There are two faint starlike condensations of nebulosity *south preceding* the nucleus.

Photograph of the Nebulæ H I. 143 and II. 536 Virginis.

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebulæ H I 143 and II 536 *Virginis*, R.A. $12^h\ 55^m$, Decl. 3° 4′ north, was taken with the 20-inch reflector on 1894 April 9, with exposure of the plate during three hours, and the copy now presented is enlarged to the scale of 1 millimetre to 6 seconds of arc.

The nebula H I 143 is No. 4900 in the *New General Catalogue*, and No. 3356 in the *General Catalogue*, and is described by Sir J. Herschel as considerably bright; considerably extended; star 10th mag., attached at about the position-angle 135°; four observations made. An engraving of the nebula is given in the *Philosophical Transactions* 1833, plate 14, fig. 67, but it does not well correlate with the photograph.

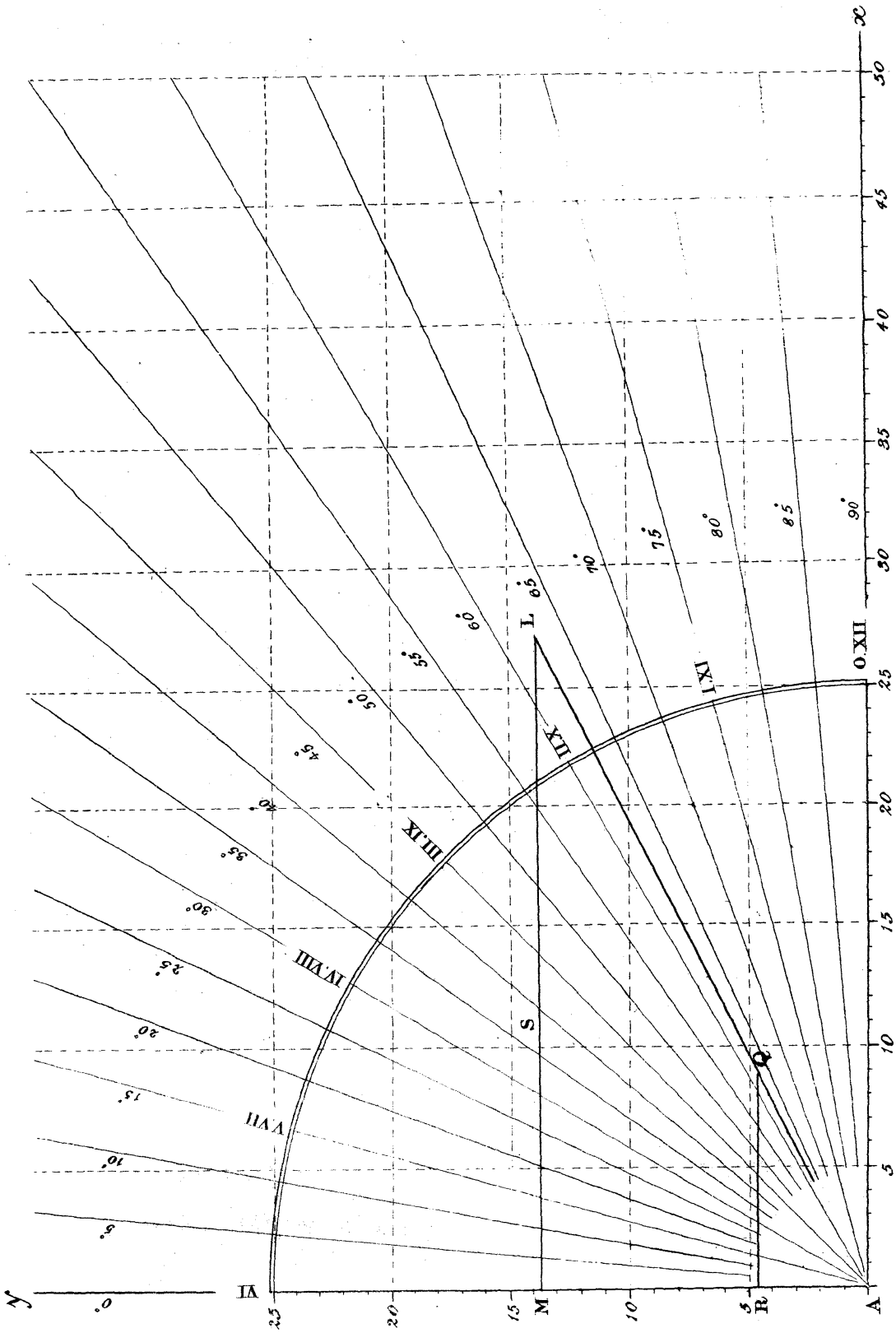
Lord Rosse (*Observations of Nebulæ and Clusters of Stars*, pp. 123, 124) records the results of seven observations made between 1855 and 1862, and he sometimes saw the nebula like the *Owl Nebula* (*h* 838), with a bright extended patch in the centre and dark spots on each side of this. Sometimes a dark ring is seen all the way round, but blackest to right and left (s.p. and n.f.). The nebulosity round is mottled, and he thought that sometimes he saw it as a spiral with a break in the outer annulus. "The darkness north of the nucleus (which is faint) certainly exists." A marginal sketch is given, but it does not resemble the photograph, except in the part which is circular in outline.

The photograph shows the nebula to somewhat resemble the letter D, with the curved side in *north preceding* direction, and a star of about 15th magnitude in the centre of curvature, the interior being filled with nebulosity of different densities, within which are five or six starlike condensations, and these give to the nebula the ring appearance referred to by Lord Rosse, but there is no spiral appearance visible in it as suggested by him. The less dense parts of the nebulosity are suggestive of dark lanes across the interior, but in reality they are the effect of contrast.

The *south following* part of the nebula is almost a straight line, with a star of about 13th magnitude close to it, but not in actual contact, and at sidereal time 10 hours on April 3 there was a minor planet* 317 seconds of arc *preceding*, and 317 seconds of arc *north* of the star above referred to. At sidereal time 10 hours on April 9 there was another minor planet at 57·83 minutes of arc *following*, and 383 seconds of arc *north* of the same star. The first of the minor planets would be equal to about 12th magnitude star, and the second to about 13th magnitude. I do not know if these planets have been previously discovered.

The nebula H II. 536 is also shown on the negative.

* Dr. Downing has kindly searched and found this planet to be *Hecate* (100)



On the Computation of Star-corrections. By W. H. Finlay, M.A.

Professor Turner's paper in the April number of the *Monthly Notices* leads me to describe a diagram which I tried some years ago for computing star-corrections.

On squared paper a quadrant of a circle, with radius representing 25″, is drawn, and is graduated to every degree by radial lines from the centre A (plate 1). These graduations also represent angles of four minutes of time at A. (Only a few of these lines are shown in the figure, so as to avoid confusion.)

Ax is the initial line for time from 0^h to 6^h; Ay for time from 6^h to 12^h and for declination.

The star-corrections are given by the formulæ

$$\Delta\alpha = f + g \sin (G + \alpha) \tan \delta + h \sin (H + \alpha) \sec \delta$$
$$\Delta\delta = i \cos \delta + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta.$$

The first step is to form the sums $(G + \alpha)$ for all the stars observed on any particular day, and with the corresponding value of g as radius describe a quadrant of a circle about A. Let S be the point where the radial line corresponding to a certain star's $(G + \alpha)$ cuts the circle of radius g.

Through S draw MSL, parallel to Ax, to meet the line of the star's declination in L. Then

$$LM = AM \tan \delta = g \sin (G + \alpha) \tan \delta$$

and

$$SM = g \cos (G + \alpha).$$

After these terms have been obtained for all the stars, the sums $(H + \alpha)$ are to be formed and a circle of radius h drawn. For convenience I shall use the same circle as before on the diagram, and take S as the point where the radial line to $(H + \alpha)$ cuts the circle of radius h.

Take AQ along the declination line of the star and equal to SM. Then

$$AL = AM \sec \delta = h \sin (H + \alpha) \sec \delta$$
$$QR = SM \sin \delta = h \cos (H + \alpha) \sin \delta.$$

The values of $i \cos \delta$ can be easily obtained by drawing a similar circle of radius i on the diagram, or (if i be very small) they can be taken from a little table. The corrections, therefore, are

$$\Delta\alpha = f + LM + AL$$

and

$$\Delta\delta = i \cos \delta + SM + QR.$$